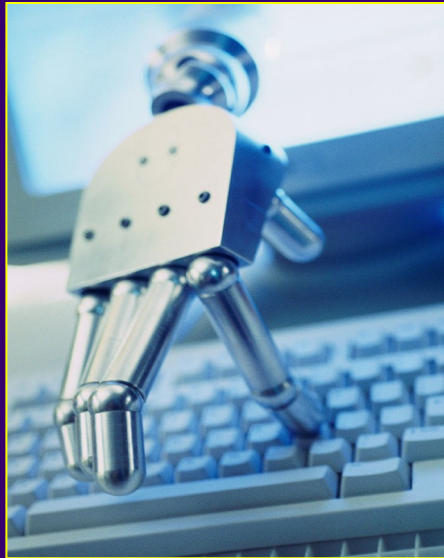


INTRODUCTION TO ERGONOMICS

A/P Resources, Inc.



Oct 04

What does this mean?



OVERVIEW

- ◆ **What is Ergonomics?**
- ◆ **Why is Ergonomics a Concern?**
- ◆ **Work Related Musculoskeletal Disorders**
- ◆ **Risk Factors**
- ◆ **Workstation Design Principles**
- ◆ **Ergonomic Solutions Yes**



WHAT IS ERGONOMICS?

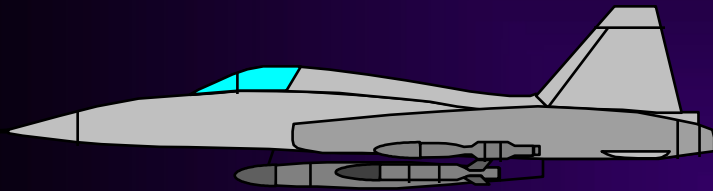


- Layman's definition: Fitting the job to the person
- Ergonomics = Human Factors

WMSD SYNONYMS

- ◆ Cumulative trauma disorder or injury
- ◆ Repetitive motion injury
- ◆ Repetitive strain injury
- ◆ Occupational overuse syndrome

ERGONOMICS IS NOT NEW



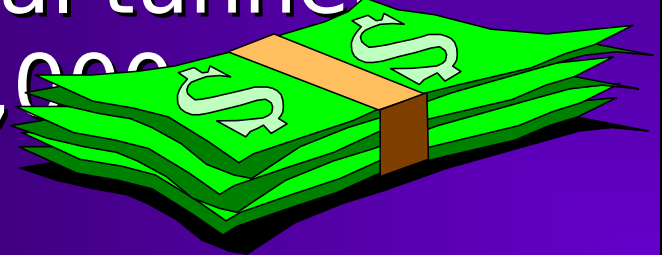
Early emphasis:
Improving pilot performance

Recent interest:
Improving worker health
and productivity



WHY IS ERGONOMICS A CONCERN?

- 50% of all occupational injuries
- Back injuries = 40% worker compensation costs
- Average cost back surgery: \$180,000
- Average cost of carpal tunnel surgery: \$22,000-\$30,000



GOALS OF ~~ERGONOMICS~~

1. Reduce injuries and illnesses

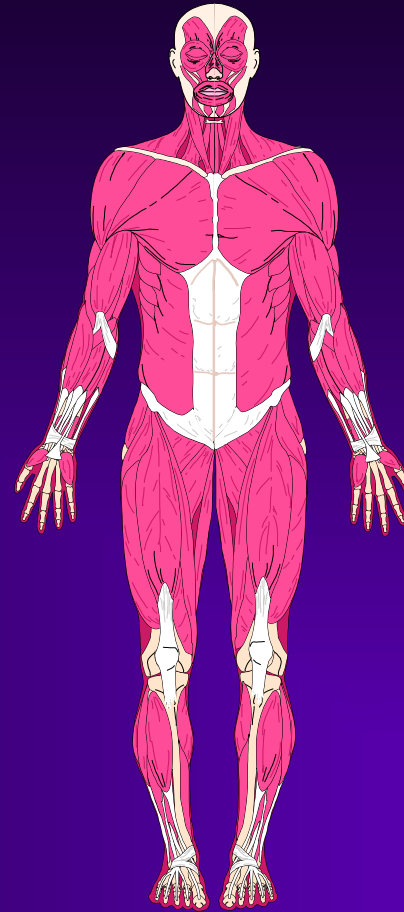
2. Increase productivity
3. Increase quality of work
4. Increase worker satisfaction and morale



WORK-RELATED MUSCULOSKELETAL DISORDERS (WMSDs)

EXAMPLES

- Localized and Whole Body Fatigue
- Lower Back Pain
- Bursitis
- Tendinitis
- Tenosynovitis
- Carpal Tunnel Syndrome



Physical Conditions -

Fatigued Muscles – move the body

Pinched Nerves – relay info to brain

Reduced Blood Flow – oxygen/waste

Degenerated Joints – elasticity

Swollen Tendons – connect muscle to bone

Stretched Ligaments – produce stability

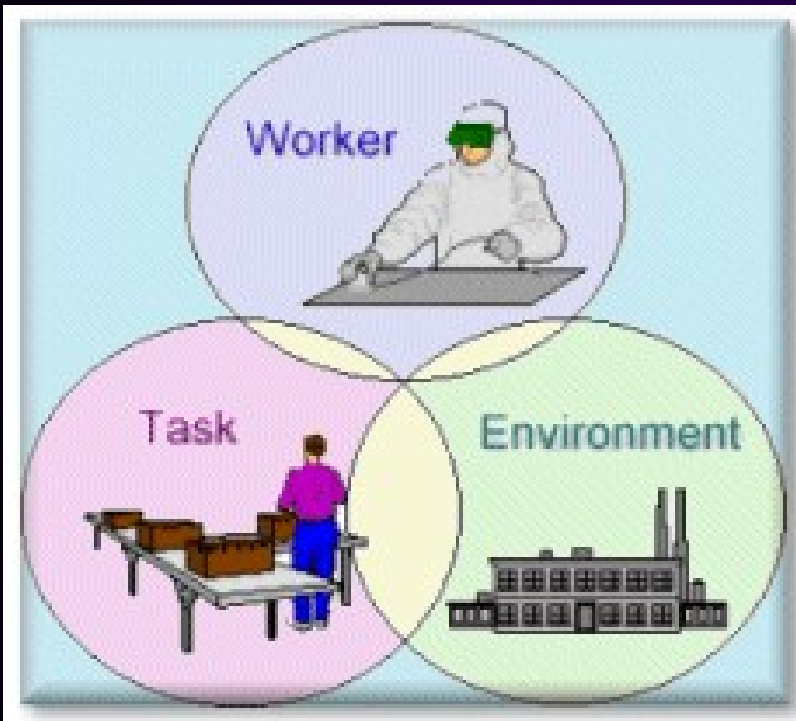
Symptoms - (Subjective/the way you feel)

- **Shooting/stabbing pain**
- **Soreness/stiffness**
- **Burning sensation**
- **Fatigue or heavy feeling**
- **Tingling or numbness**
- **Pressure or tightness**

Signs - (Objective & Measurable)

- **Fingers and toes change color**
- **Swelling or inflammation**
- **Loss of mobility**
- **Decrease range of motion**
- **Loss of feeling**
- **Decreased sensation**
- **Loss of strength**

THE INTERACTION OF THREE RISK FACTOR AREAS



- **Person/Worker -**
 - age, physical condition/fitness
 - Psychosocial
- **Process/Task -**
 - tool
 - equipment
- **Environment -**
 - lighting
 - temperature
 - noise

WHAT ARE WMSDs RISK FACTORS?



Routine Exposure to:

- ✓ Forceful Hand Exertions
- ✓ Repetitive Movements
- ✓ Fixed or Awkward Postures
- ✓ Contact Stress
- ✓ Vibrating Tools
- ✓ Unassisted Frequent or Heavy Lifting

FORCE



Force - Mechanical Assist



Avoid pushing or pulling heavy loads



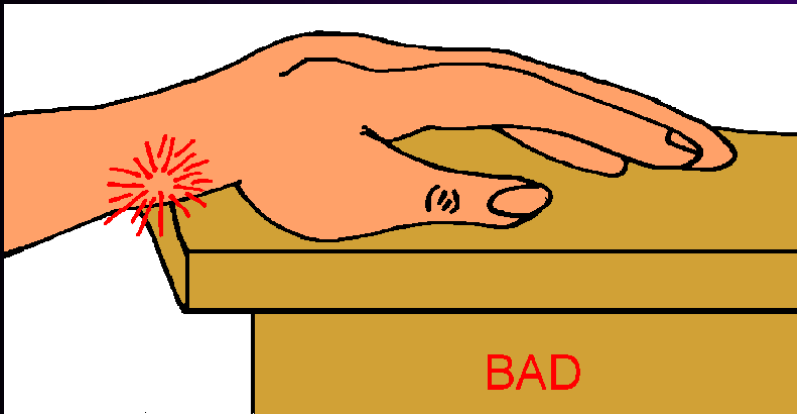
When possible, use mechanical assist devices

AWKWARD POSTURES

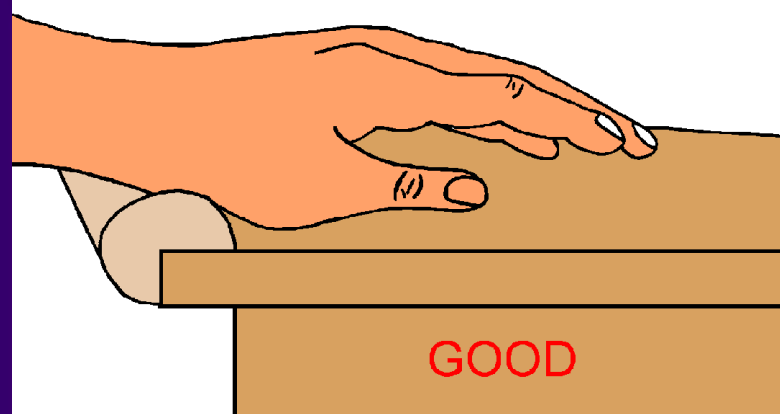


MECHANICAL OR CONTACT STRESS

Sharp edges on desks, tools, or sea



BAD



GOOD

REPETITION



VIBRATION



SAFE LIFTING/CARRYING TECHNIQUES



- Use two hands
- Keep the load in front of your body
- Don't twist your back
- Make sure the load is balanced
- Make sure you have good footing and unobstructed walkways
- Maintain good posture, lift with you legs, not your back
- Lift and carry the load as close to the body as possible
- Maintain the back in the natural posture as much as possible when lifting and carrying (natural S curve).

maintain good posture, lift with you legs, not your back



Keep objects at waist level whenever possible



Avoid lifting objects that are below the knuckles



Lift objects from approximately waist level

Do -



BACKBELTS



??

ERGONOMIC SOLUTIONS

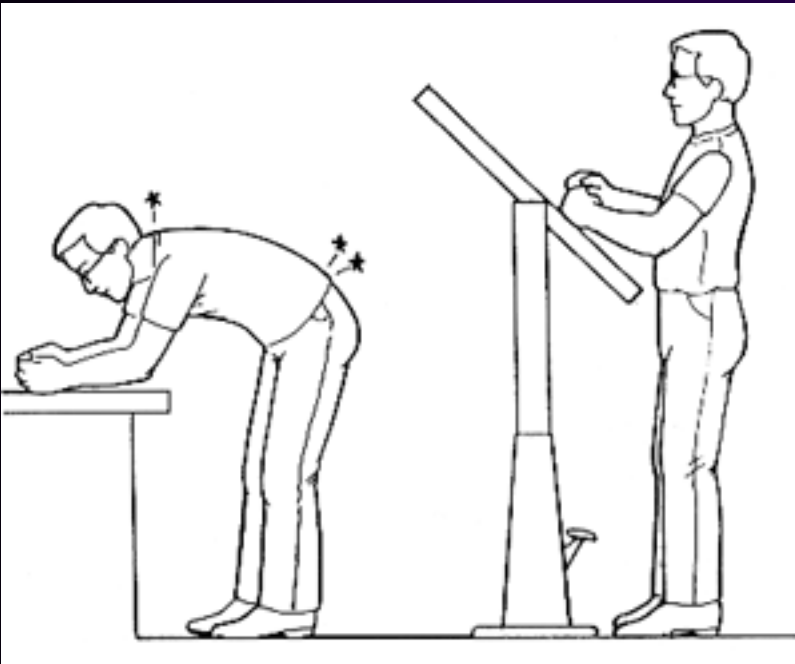
ENGINEERING CONTROLS



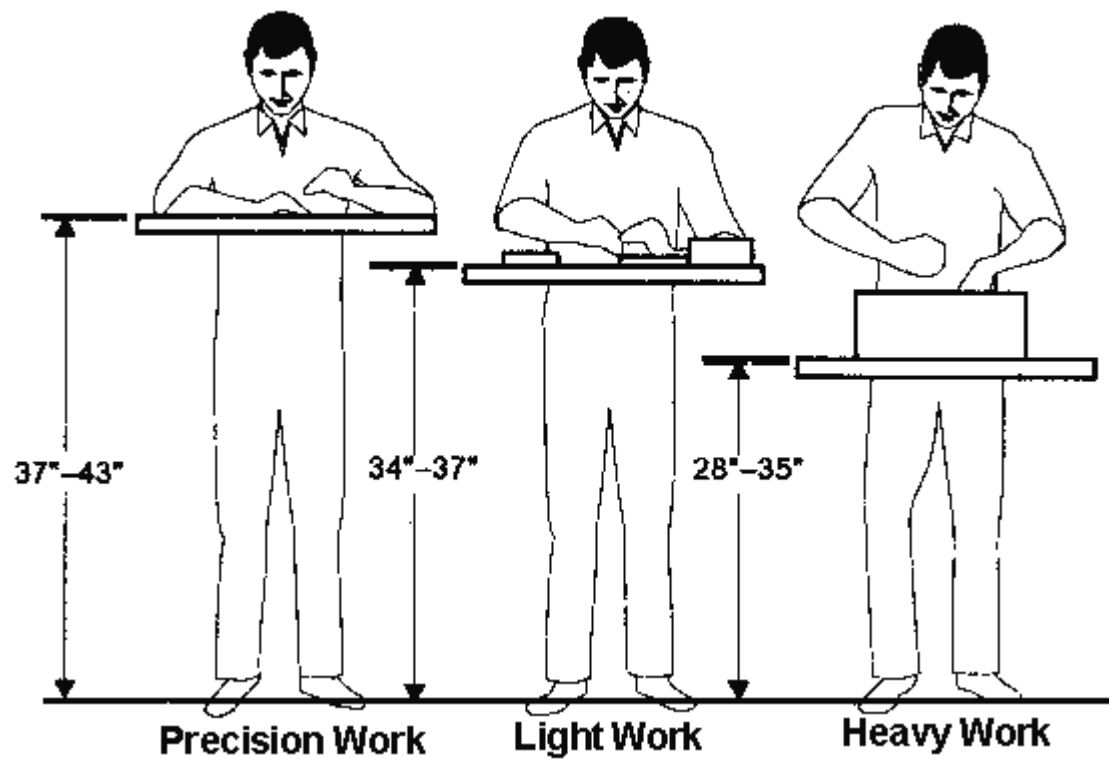
Emphasize “Low-tech”

- Use of adjustable furniture/fixtures
- Use of ergonomically designed tools
- Suspension of heavy tools
- Use of material handling equipment and devices
- Provision of additional task lighting
- Redesign of controls/displays
- Job automation

Engineering Controls



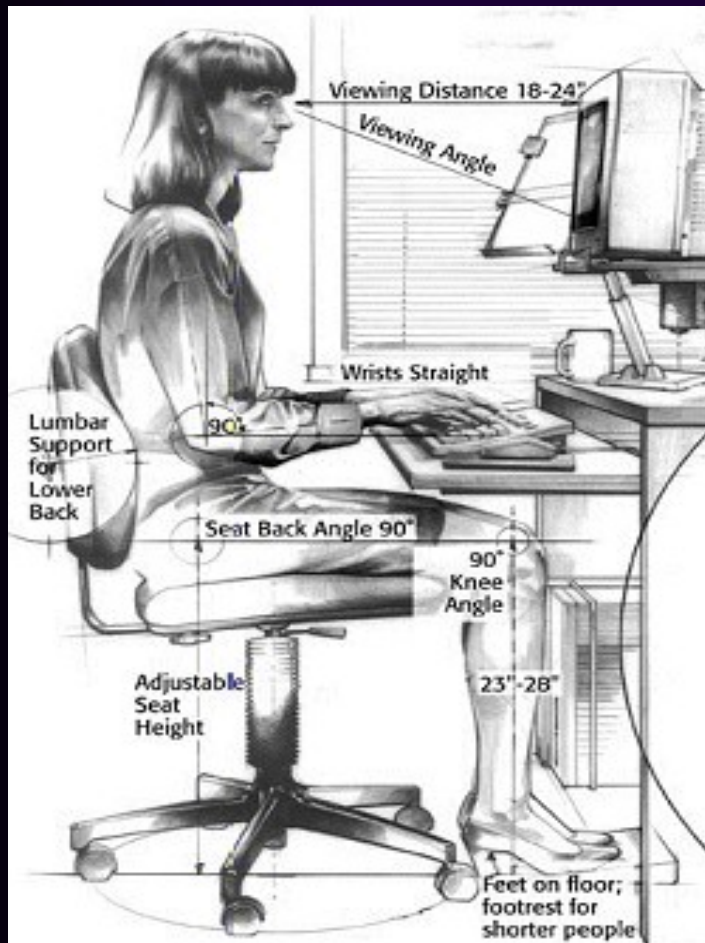
**Use of adjustable
furniture/fixtures**



THE WORKSTATION

- A good, adjustable chair with firm support
- A table, computer monitor and keyboard at the right height
- A comfortable mouse or other pointing device
- Adequate workspace to place papers, a telephone and frequently needed items within easy reach
- Perform stretches and exercises during work breaks
- Shift position frequently while sitting
- Take frequent breaks
- Use neutral posture and avoid positions that place strain on the musculoskeletal system

Neutral Posture



Minimizes stress on joints - to work longer and be more productive without fatigue or pain

Keep the working elbow at the side of the body, forearm semi-pronated, & wrist straight.



ADMINISTRATIVE CONTROLS



- Train personnel in proper work techniques & use of ergonomically designed tools and workstations
- Decrease production rates & limit overtime
- Restructure jobs to allow for self pacing and for sufficient rest
- Increase the # of workers performing a task
- Allow for job rotation
- Adjust size/weight of the product handled
- Institute a preventive maintenance program for tools & equipment to reduce ergonomic stress



Avoid bending to the side or over reaching to grab items



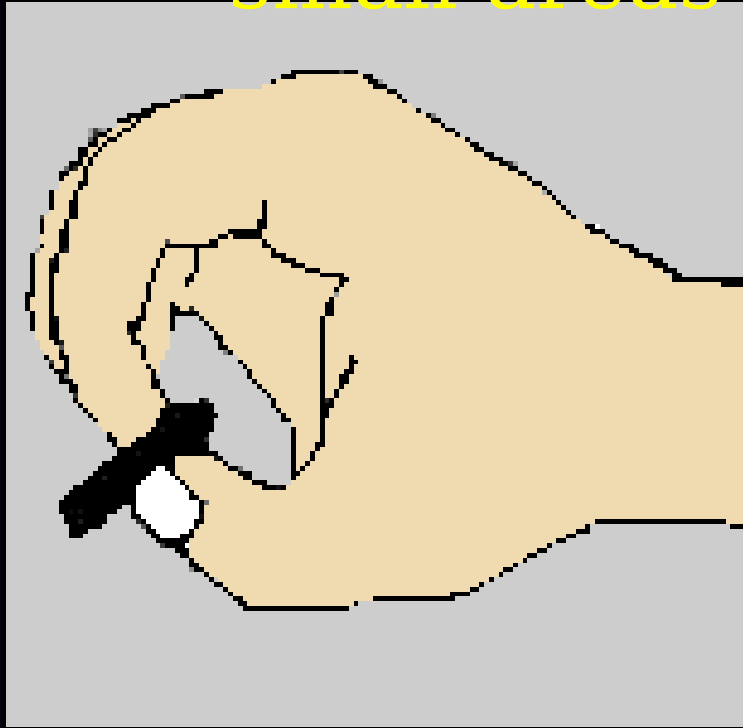
Put frequently used items closer to avoid reaching

PROPER USE OF APPROPRIATE EQUIPMENT

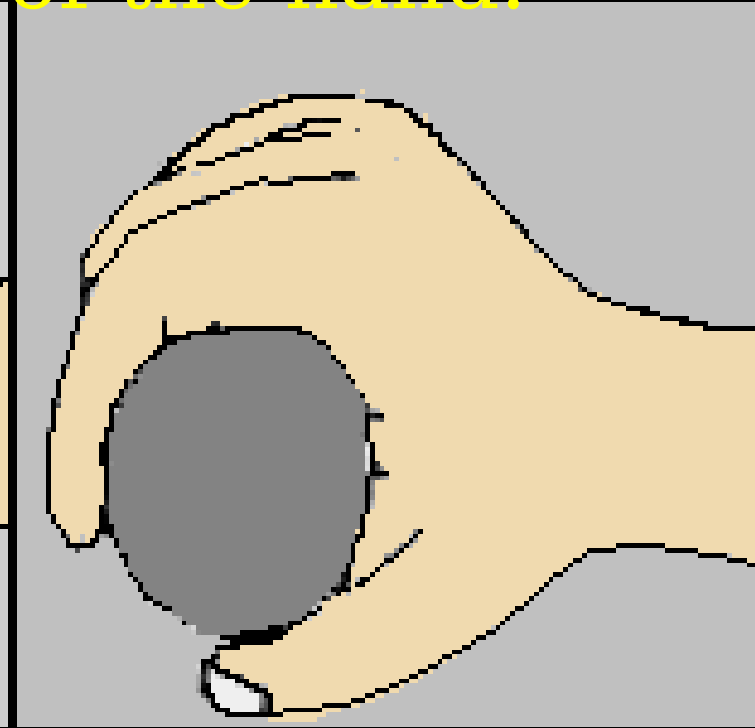


**Use tools with handles
of appropriate size
& shape, with
edges and sharp
corners rounded off**

Avoid narrow tool handles that concentrate large forces into small areas of the hand.



Avoid pinching when grabbing objects



Use a power grip, grabbing the whole object

Avoid sharp edges -



Avoid pressing on hard objects and sharp corners



Use tools with rounded corners

Adjust size/weight of the product handled

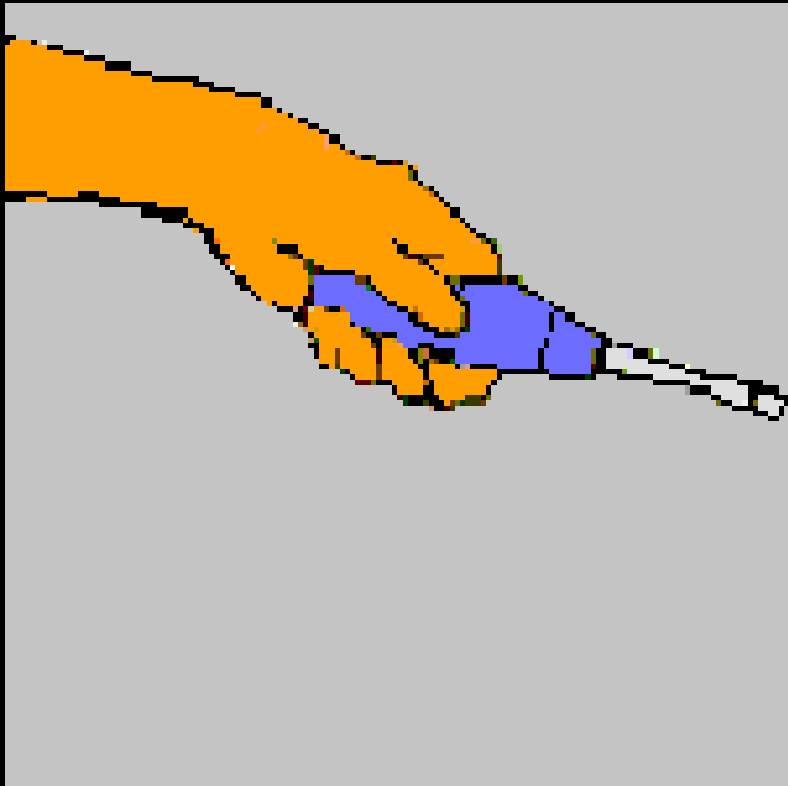


Avoid heavy objects
without handles



Use proper handles for
objects over 10 lbs.

Use tools with preformed grip handles that comfortably fit your hand

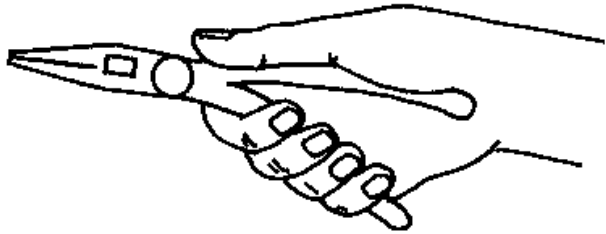


Avoid rapid or repeated rotation of the forearm

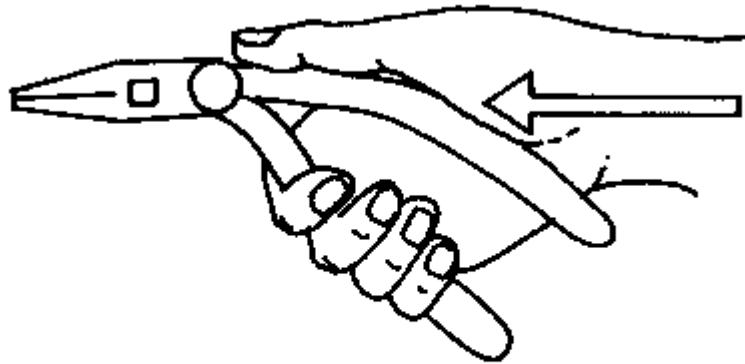


When possible use powered tools

Tools

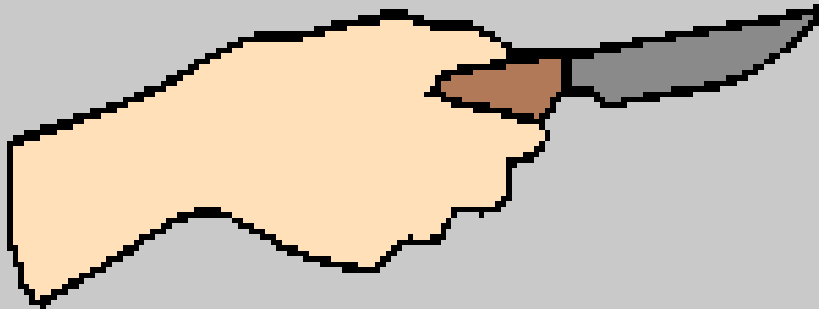


Bad

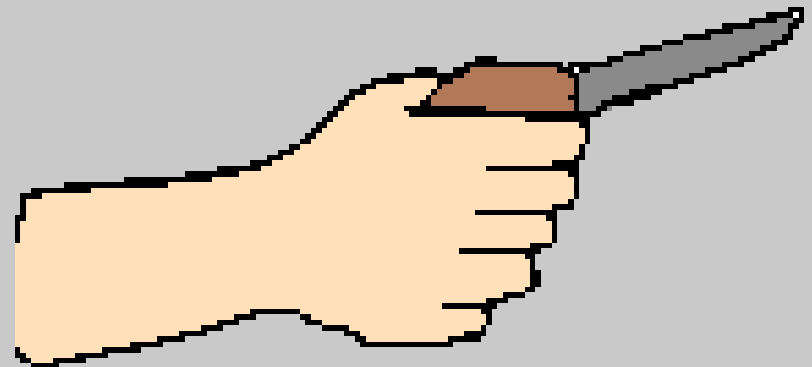


Good

Avoid repetitive or sustained exertions, especially if they are accompanied by deviations from a straight wrist or forceful exertions



Avoid bending the wrist to the side



Select tools that support a good posture

Chairs -



Avoid standing in a static posture for long periods



Provide seating when possible

Chairs -

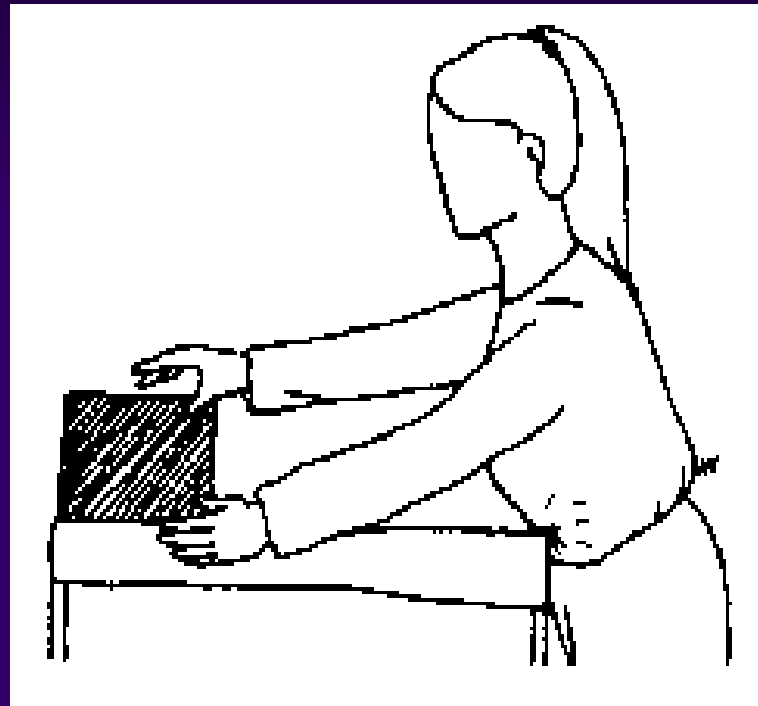
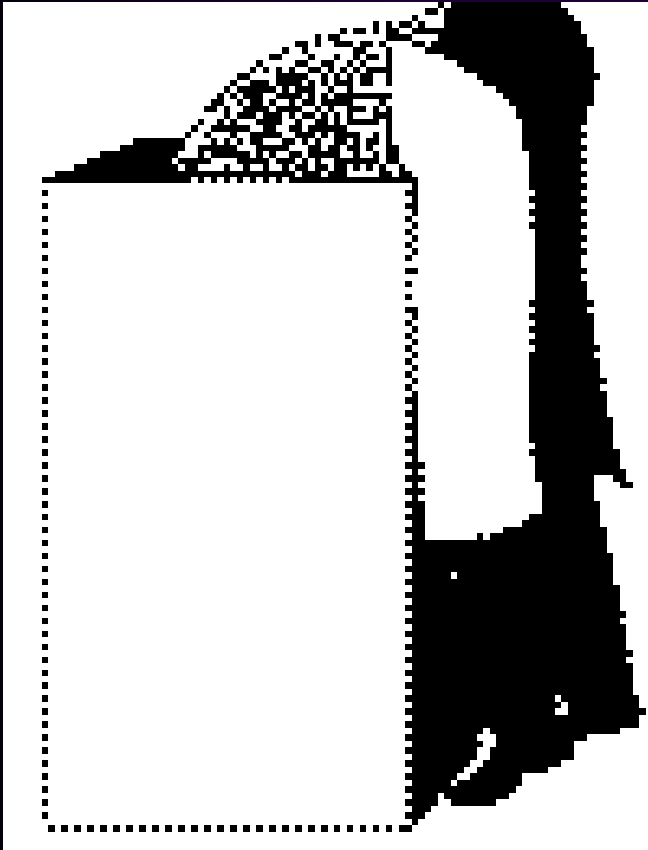


Avoid using chairs without good back support



Proper lumbar and back support is important

Look familiar?



Ergonomic Problems?











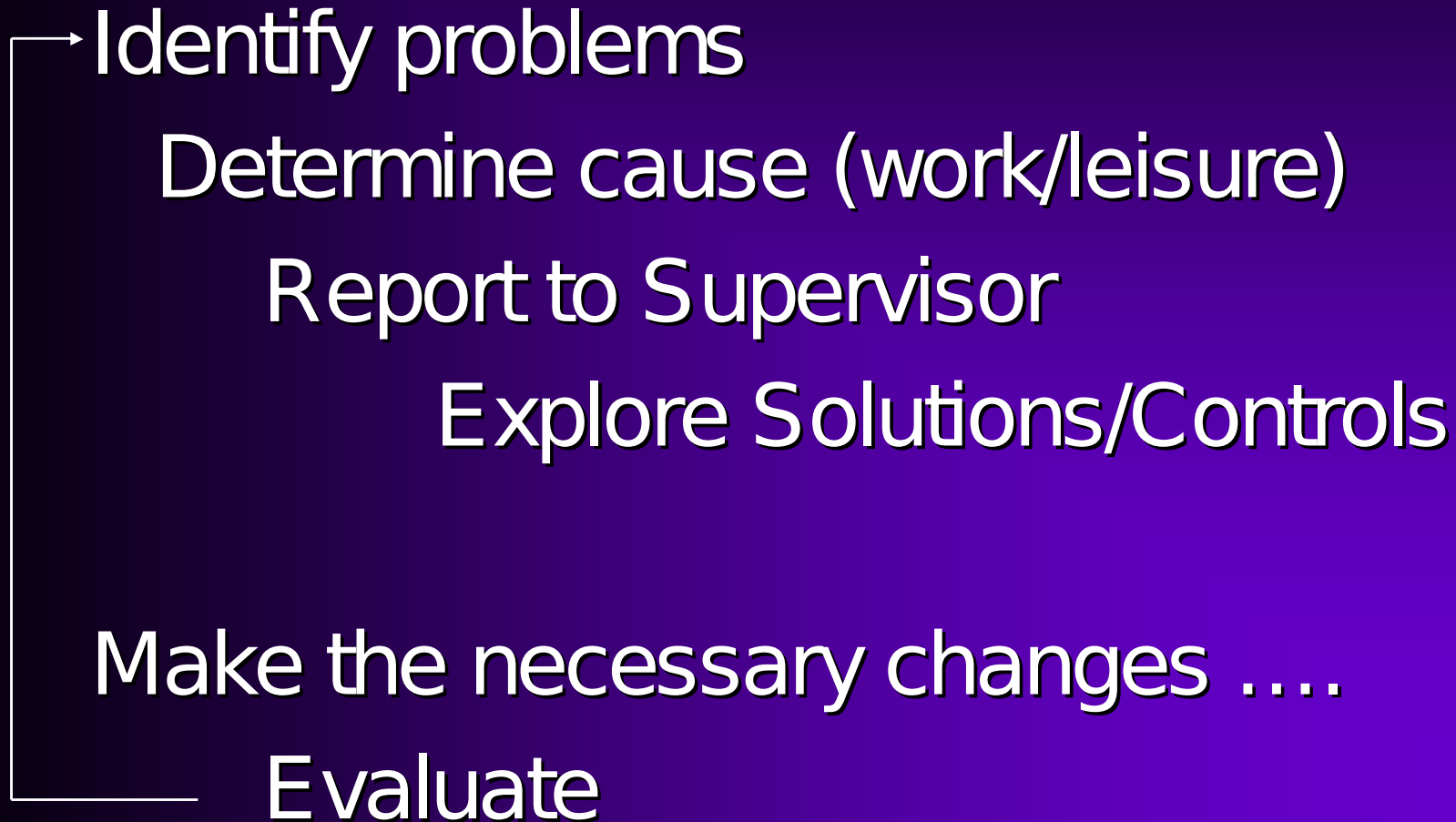




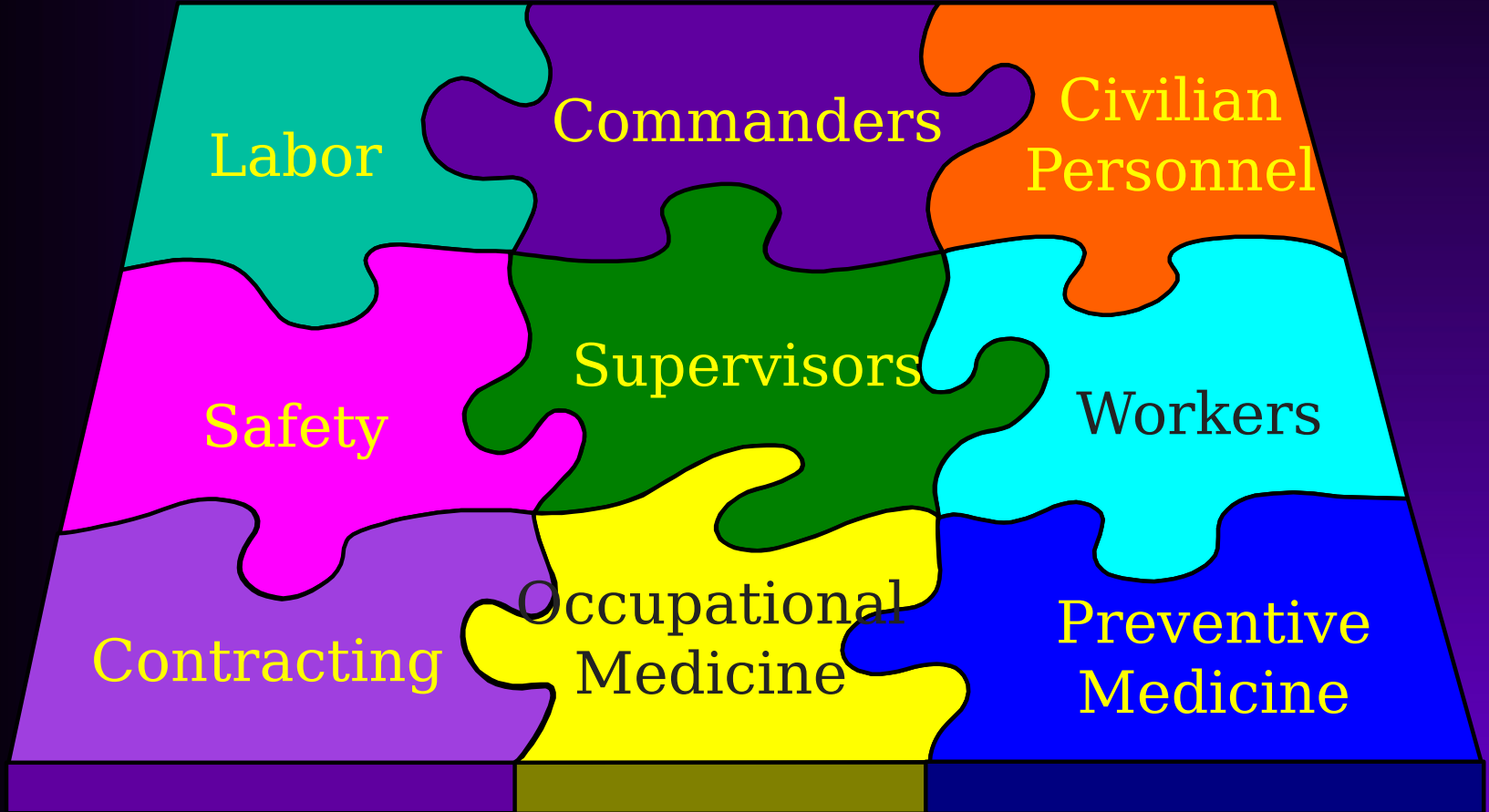


The employees and the management share the responsibility to maintain a safe working environment

Job Hazard Analysis



SUCCESS REQUIRES A TEAM EFFORT



Need an ergonomic
evaluation?

**Contact the Safety Office
at**

221-3836 or 295-SAFE